

# *Sciurus oculatus*. By Troy L. Best

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## *Sciurus oculatus* Peters, 1863

### Peters' Squirrel

*Sciurus oculatus* Peters, 1863:653. Type locality "Mexico," probably near Las Vigas, Veracruz (Nelson, 1899:88).

*Sciurus niger melanonotus* Thomas, 1890:73. Type locality "Las Vigas, Jalapa," Veracruz, Mexico.

**CONTEXT AND CONTENT.** Order Rodentia, Suborder Sciurognathi, Family Sciuridae, Subfamily Sciurinae, Genus *Sciurus*, Subgenus *Sciurus* (Wilson and Reeder, 1993). Based upon structure of the hyoid bones, *S. oculatus* also has been placed into the subgenus *Parasciurus* (Hoffmeister and Hoffmeister, 1991). The genus *Sciurus* contains 28 species (Wilson and Reeder, 1993). Three subspecies of *S. oculatus* are recognized (Hall, 1981):

*S. o. oculatus* Peters, 1863:653, see above (*melanonotus* Thomas is a synonym).

*S. o. shawi* Dalquest, 1950:4. Type locality "Rancho San Francisco, 38 kilometers east-southeast of the City of San Luis Potosí, San Luis Potosí, México."

*S. o. tolucae* Nelson, 1898:148. Type locality "north slope of Volcano of Toluca, Mexico, Mex."

**DIAGNOSIS.** *Sciurus oculatus* may be sympatric with *S. aureogaster* and *S. deppei* (Hall, 1981; Musser, 1968). *S. oculatus* (total length, 530-560 mm) is about the size of *S. aureogaster* (total length, 418-573 mm), but *S. oculatus* has a stouter body (Dalquest, 1953; Hall, 1981) and does not have a P3. *S. deppei* (total length, 343-387 mm) has the P3 and is much smaller than *S. oculatus*. Superficially *S. oculatus* resembles *S. carolinensis*, especially the more southern subspecies of *S. carolinensis*. The most obvious difference is the absence of P3 in *S. oculatus* (Fig. 1). Genetic relationships may be closer to *S. niger* than to *S. carolinensis* (Hall, 1981).

The ranges of *S. oculatus* and *S. alleni* approach each other in San Luis Potosí, but these taxa are not sympatric (Hall, 1981). *S. oculatus* and *S. alleni* show no marked differences (Baker, 1956; Dalquest, 1953), but on average *S. alleni* has a smaller skull, smaller body, grayer feet, and whiter venter (Nelson, 1899). Compared with *S. alleni*, *S. oculatus shawi* in San Luis Potosí has: buffy, rather than brownish or whitish feet; distinct, buffy postauricular patches; deep-buffy underparts rather than white underparts. In *S. alleni*, the postauricular patches usually are absent, and when present usually consist of a tiny area where the pelage is slightly shorter and grayer than on the surrounding part of the head (Dalquest, 1950). The postauricular patch is prominent and buffy on *S. o. shawi* and dirty white on *S. o. tolucae* (Hall, 1981).

**GENERAL CHARACTERS.** Peters' squirrel is a large tree squirrel (Dalquest, 1953; Nelson, 1899). The upperparts are either uniform grizzled gray or have a median band or strong suffusion of black. The ears and orbital ring are dull white to buffy. Dorsally, the tail is black with a heavy suffusion of white. Ventrally, the tail is grizzled gray to yellowish brown, with a border of black hairs tipped with white. The underparts vary from white with pale-yellowish suffusion to rich ochraceous-buff (Hall, 1981).

In *S. o. oculatus*, the crown between the ears and the broad band along the middle of the back from the shoulders to the base of the tail are black or blackish, shading on the edges to dark gray like the remainder of the upperparts. The ring around the eye is well marked, buffy whitish or buffy. The cheeks usually are grizzled gray like the sides of the neck, but sometimes are washed with buff. The ears are dingy gray and frequently washed with dull buff of variable intensity. The basal ear patch varies from dingy white to dark buffy (sometimes absent in summer). The feet vary from grizzled gray washed with buffy to rich buff shading to gray on the outside

of the forelegs. The outsides of the lower hind legs vary from gray, as the rest of the thigh, to dark rusty brownish. The underparts vary from white with pale dull-buffy suffusion to rich ochraceous-buff. Dorsally, the tail is black and heavily washed with white. Ventrally, the tail has a broad median area of grizzled yellowish-gray, bordered with black and heavily edged with white. The hairs



FIG. 1. Dorsal, ventral, and lateral views of cranium and lateral view of mandible of *Sciurus oculatus* from Encarnacion, Hidalgo, Mexico (male, United States National Museum of Natural History 81439). Greatest length of cranium is 61.7 mm.

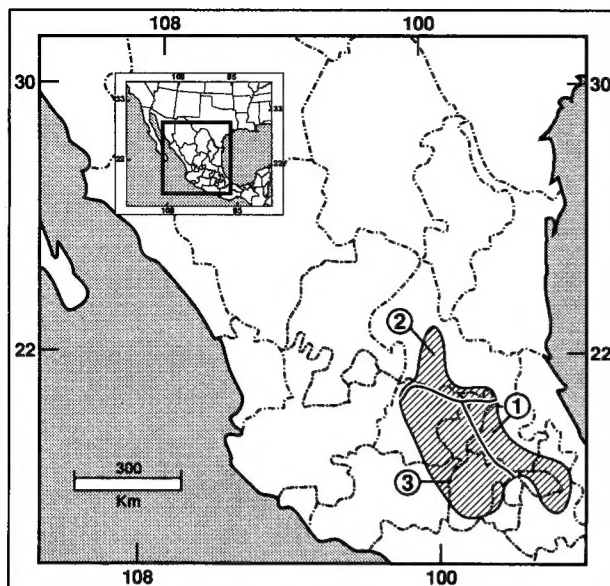


FIG. 2. Distribution of *Sciurus oculatus* in Mexico (Hall, 1981): 1, *S. o. oculatus*; 2, *S. o. shawi*; 3, *S. o. tolucae*.

of the back are black, with one or two rings of gray, yellowish gray, or brownish gray, mixed with other hairs that are wholly black (Nelson, 1899).

In *S. o. shawi*, the upperparts are pale gray, and the underparts are pale buff. The nose and face are grizzled, the eye ring is warm buff, and the top of the head is near hair brown mixed with cinnamon. The upperparts are mixed black and avellaneous, resulting in a general color of drab or buffy brown. The sides are more whitish and less black than the back. The postauricular spots are near pinkish buff. The underparts are pinkish cinnamon. The tops of the feet are cinnamon. The top of the tail is white with black underfur showing through where disarranged. The underside of the tail is tricolored; the central area of the tail is 35 mm wide and drab, the intermediate area is 8 mm wide and black, and the edge is 10 mm wide and white. Variations are slight, but postauricular spots may be reduced in some individuals, and the middorsal area may be slightly darker in some individuals than in others (Dalquest, 1953).

In *S. o. tolucae*, the top of the head and the broad median line down the back to the base of the tail are gray with a faint blackish or dull brownish wash shading laterally into clearer grizzled-gray. However, the grizzled gray has slight shading of yellowish on the subterminal rings of some hairs. The ring around the eye is grayish white with a pale-buffy shade. The rest of the sides of the head are dingy gray suffused with dull buffy or pale brownish. The ears are dull gray shaded with buff. The patch behind the ear is dingy white. The feet are grayish white with a buffy wash that is deeper than on the underparts. The thighs near the feet are suffused with yellowish brown. Dorsally, the tail is black and heavily washed with white. Ventrally, the tail along a median line is grizzled yellowish-gray or pale yellowish-brown, bordered with black and broadly edged with white. The hairs of the back are black with one or two rings of gray, yellowish, or brownish gray, mixed with other hairs that are wholly black (Nelson, 1899).

There is relatively little variation within subspecies. In *S. o. oculatus*, the black dorsal band usually is present, sometimes is continuous from the crown to the tail, and is 25–50 mm in width. However, the black dorsal band also may be represented only by a black wash. The buff of the underparts of some individuals is richer than that in others. The intensity of the buff of the feet accompanies and varies with the same color on the underparts. One melanistic specimen is known from Pinal de Amoles, Querétaro. Color of *S. o. tolucae* varies little, and this mainly is in the amount of buffy on the feet and in the intensity of the dark wash along the middle of the back. One melanistic specimen is known from the type locality (Nelson, 1899).

Compared with *S. o. oculatus*, *S. o. tolucae* is paler, with a wash of blackish or blackish brown along the middle of the back.

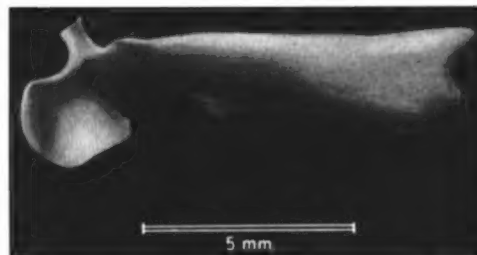


FIG. 3. Baculum of *Sciurus oculatus* from Amoles, Querétaro, Mexico (modified from Burt, 1960).

The underparts are dingy whitish, with only a faint suffusion of buffy. Compared with *S. o. oculatus* (Fig. 1), the skull of *S. o. tolucae* is similar, but in nearly all individuals the nasals are narrower posteriorly with a corresponding increase in breadth of the premaxillaries. *S. o. tolucae* can be distinguished from *S. o. oculatus* by the whitish ear patches and whitish ventral surface in *S. o. tolucae* (Nelson, 1899). *S. o. shawi* differs from *S. o. oculatus* in lacking the stripe along the back. This stripe always is present in *S. o. oculatus*, but varies from a deep black band to a blackish wash. In *S. o. shawi*, there is no trace of a dark wash on the back. From *S. o. tolucae*, *S. o. shawi* differs, as it does from *S. o. oculatus*, in lacking the blackish dorsal stripe, and in addition *S. o. shawi* is rich buff rather than whitish beneath (Dalquest, 1950).

Averages of external and cranial measurements (in mm) of *S. o. oculatus*, *S. o. shawi*, and *S. o. tolucae*, respectively, are: total length, 543, 508, 531; length of tail, 269, 256, 263; length of hind foot, 73, 68, 69; basilar length of cranium, 54.6, 55.9, 54.0; palatal length, 28.5, —, 29.0; interorbital breadth, 20.3, 20.2, 20.5; zygomatic breadth, 36.3, 36.5, 36.7; length of upper toothrow, 11.0, 11.2, 11.0 (Dalquest, 1953; Nelson, 1899).

**DISTRIBUTION.** *Sciurus oculatus* is endemic within the Trans-Mexican neovolcanic belt (Fa and Morales, 1991), and it ranges over the Mexican Plateau from the Mexican states of Morelos, Distrito Federal, México, Puebla, and Veracruz northward into San Luis Potosí (Fig. 2; Dalquest, 1953; Hall, 1981). Peters' squirrel occupies oak (*Quercus*), pine (*Pinus*), and fir (*Abies*, *Pseudotsuga*) forests in the lower Sonoran, upper Sonoran, transition, Canadian, and Hudsonian life zones at elevations of 1,500–3,600 m (Goldman, 1951; Hall, 1981; Nelson, 1899).

**FOSSIL RECORD.** The genus *Sciurus* evolved by the early Miocene (Black, 1972). No fossils of *S. oculatus* are known.

**FORM AND FUNCTION.** The dental formula is  $i\ 1/1, c\ 0/0, p\ 1/1, m\ 3/3$ , total 20 (Hall, 1981). The hyoid apparatus consists of a single basihyal and paired thyrohyals, ceratohyals, and stylohyals; the basihyal is thick, triangular in cross-section, long, and fuses with the short thyrohyals at an early age (Hoffmeister and Hoffmeister, 1991).

The pelage is dense and rather coarse. The hair of the middorsal area is 15 mm long, hair of the middle of the tail is 58 mm long, and near the tip of the tail the hair is 80 mm long (Dalquest, 1953). The underfur is long, and the tail is long and full. The four pair of mammae are arranged as follows: one pectoral; two abdominal; one inguinal (Nelson, 1899).

The baculum of *S. oculatus* (Fig. 3) is most like bacula of *S. arizonensis*, *S. carolinensis*, and *S. niger*. The basal portion of the shaft is circular or nearly so in cross section. The shaft tapers distally, with an apparent twist, to its smallest diameter, which is called the neck. At this point the shaft usually curves dorsally and expands into a broad circular disc that is concave on the right side and convex on the left. Ventral to this expanded disc is a definite spur. In *S. oculatus*, the shaft tapers to a narrow neck, just proximal to the expanded distal end, and the spur is blunt instead of coming to a point as in the other squirrels. The posterior part of the disc ends in a definite point and is shaped like a hook. There is a prominent dorsal keel on the shaft. Measurements of two bacula from Querétaro are: length, 10.8, 11.5; length of expanded tip, 2.7, 3.0; height of tip, 3.2, 3.2; height of base, 2.5, 2.8; width of base, 1.9, 2.1 (Burt, 1960).

**ONTOGENY AND REPRODUCTION.** In Veracruz, females in July and August had enlarged mammae, indicating an earlier litter of young, but no young-of-the-year were observed. No pregnant females were observed 26 July–4 August (Davis, 1944).

**ECOLOGY AND BEHAVIOR.** *Sciurus oculatus* occurs in the pine and oak forests of the tableland slope of the Sierra Madre Oriental and the arid mountains of southern and western Querétaro, central and eastern Guanajuato, and southern San Luis Potosí (Nelson, 1899). In San Luis Potosí, *S. oculatus* lives in oak woods on the mountains of the Mexican Plateau, exclusive of the crest of the Sierra Madre. Peters' squirrel is common in summer in the vicinity of Alvarez, where it lives in the low oak forest on the mountainsides. However, *S. oculatus* was not present there in late October, after the weather had turned cold. Some were observed in deep arroyos in nearby valleys where they were feeding on almonds (*Prunus*) and were secretive. They moved swiftly through the trees and easily crossed gaps of  $\geq 2$  m (Dalquest, 1953). At Villar, San Luis Potosí, near the northern border of its range, *S. oculatus* occurs in the oaks of the upper and lower Sonoran zones (1,650–1,800 m elev.) where it feeds on acorns and wild figs (*Ficus*) in the canyon bottoms. Its main food supply, however, is obtained from various species of pines (Nelson, 1899). In Veracruz, *S. oculatus* occupies pine forests at the higher elevations. On the timbered slopes of Cofre de Perote and Mount Orizaba, this is the common squirrel (Davis, 1944).

The only ectoparasites known from Peters' squirrel are the lice *Enderleinellus longiceps* (Ferris, 1951) and *E. oculatus* (Kim, 1966). No endoparasites are known.

*Sciurus oculatus* is considered to be a "fragile" species (Ceballos and Navarro L., 1991; Ceballos and Rodriguez, 1993). It has suffered severe habitat loss through logging, burning, and clearing of forests for agriculture (Leopold, 1959; Nowak, 1991).

**REMARKS.** *Sciurus oculatus* is similar to *S. alleni* (Nelson, 1899), and *S. alleni* has been considered to be a subspecies of *S. oculatus* (Moore, 1960). Squirrels ancestral to *S. alleni*, *S. nayaritensis*, and *S. oculatus* may have spread from western Mexico across the Mesa del Norte by way of mountains in western Coahuila, Durango, and Zacatecas (Baker, 1956). Nothing is known concerning the genetics of *S. oculatus*.

*Sciurus* is from the Latin *sciurus* meaning squirrel. The specific epithet *oculatus* is derived from the Latin *oculus* referring to the eye (Jaeger, 1955). *S. oculatus* also has been referred to as the black-backed (Nelson, 1899), Toluca (Nelson, 1898), and spectacled squirrel (Dalquest, 1950).

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